SEQUENCE LISTING

<110> BOYLE, WILLIAM
LACEY, DAVID
CALZONE, FRANK
CHANG, MING-SHI
SENALDI, GIORGIO

<120> COMBINATION THERAPY FOR CONDITIONS LEADING TO BONE LOSS

<130> A-378CIP5

<140> US 09/613,591
<141> 2000-07-10

<150> US 09/457,647
<151> 1999-12-09

<150> US 09/350,670
<151> 1999-07-09

<150> US 08/706,945
<151> 1996-09-03

<150> US 08/577,788
<151> 1995-12-22

<160> 168

<170> PatentIn version 3.0

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<223> ds oligonucleotide adapter

<400> 2
tcgacccacg cgtccg 16

<210> 3
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
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<222> ()..()
<223> ds oligonucleotide adapter

<400> 3
gggtgcgcag gc 12

<210> 4
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tgtaaaacga cggccagt 18

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<400> 5
caggaaacag ctatgacc 18

<210> 6
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<223> T3 primer

<400> 6
caattaaccc tcactaaagg 20

<210> 7
<211> 23
<212> DNA
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<400> 7
gcattatgac ccagaaaccg gac 23

<210> 8
<211> 23
<212> DNA
<213> Rattus rattus

<400> 8
aggtagcgcc cttcctcaca ttc 23

<210> 9
<211> 30
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<400> 9
gactagtccc acaatgaaca agtggctgtg 30

<210> 10
<211> 45
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<223> PCR primer

<400> 10
ataagaatgc ggccgctaaa ctatgaaaca gcccagtgac cattc 45

<210> 11
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
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<223> PCR primer

<400> 11
gcctctagaa agagctggga c 21

<210> 12
<211> 21
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<220>
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<400> 12
cgccgtgttc catttatgag c 21

<210> 13
<211> 24
<212> DNA
<213> Rattus rattus

<400> 13
atcaaaggca gggcatactt cctg 24

<210> 14
<211> 24
<212> DNA
<213> Rattus rattus

<400> 14
gttgcactcc tgtttcacgg tctg 24

<210> 15
<211> 24
<212> DNA
<213> Rattus rattus

<400> 15
caagacacct tgaagggcct gatg 24

<210> 16
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<212> DNA
<213> Rattus rattus

<400> 16
taacttttac agaagagcat cagc 24

<210> 17
<211> 33
<212> DNA
<213> Rattus rattus

<400> 17
agcgcggccg catgaacaag tggctgtgct gcg 33

<210> 18
<211> 31
<212> DNA
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<400> 18
agctctagag aaacagccca gtgaccattc c 31

<210> 19
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<400> 19
gtgaagctgt gcaagaacct gatg 24

<210> 20
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<212> DNA
<213> Rattus rattus

<400> 20
atcaaaggca gggcatactt cctg 24

<210> 21
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<213> Homo sapiens

<400> 21
cagatcctga agctgctcag tttg 24

<210> 22
<211> 33
<212> DNA
<213> Homo sapiens

<400> 22
agcgcggccg cggggaccac aatgaacaag ttg 33

<210> 23
<211> 33
<212> DNA
<213> Homo sapiens

<400> 23
agctctagaa ttgtgaggaa acagctcaat ggc 33

<210> 24
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
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<222> ()..()
<223> PCR primer

<400> 24
atagcggccg ctgagcccaa atcttgtgac aaaactcac 39

<210> 25
<211> 45
<212> DNA
<213> Artificial Sequence

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<223> PCR primer

<400> 25
tctagagtcg acttatcatt tacccggaga cagggagagg ctctt 45

<210> 26
<211> 38
<212> DNA
<213> Mus musculus

<400> 26
cctctgagct caagcttccg aggaccacaa tgaacaag 38

<210> 27
<211> 43
<212> DNA
<213> Mus musculus

<400> 27
cctctgcggc cgctaagcag cttattttca cggattgaac ctg 43

<210> 28
<211> 38
<212> DNA
<213> Mus musculus

<400> 28
cctctgagct caagcttccg aggaccacaa tgaacaag 38

<210> 29
<211> 24
<212> DNA
<213> Homo sapiens

<400> 29
tccgtaagaa acagcccagt gacc 24

<210> 30
<211> 31
<212> DNA
<213> Mus musculus

<400> 30
cctctgcggc cgctgttgca tttcctttct g 31

<210> 31
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<212> PRT
<213> Mus musculus

<400> 31

Glu Thr Leu Pro Pro Lys Tyr Leu His Tyr Asp Pro Glu Thr Gly His
1 5 10 15

Gln Leu Leu

<210> 32
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<400> 32
tcccttgccc tgaccactct t 21

<210> 33
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<400> 33

cctctgcggc cgcacacacg ttgtcatgtg ttgc 34

<210> 34
<211> 21
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<213> Mus musculus

<400> 34
tcccttgccc tgaccactct t 21

<210> 35
<211> 34
<212> DNA
<213> Mus musculus

<400> 35
cctctgcggc cgccttttgc gtggcttctc tgtt 34

<210> 36
<211> 37
<212> DNA
<213> Homo sapiens

<400> 36
cctctgagct caagcttggt ttccggggac cacaatg 37

<210> 37
<211> 38
<212> DNA
<213> Homo sapiens

<400> 37
cctctgcggc cgctaagcag cttattttta ctgaatgg 38

<210> 38
<211> 37
<212> DNA
<213> Homo sapiens

<400> 38
cctctgagct caagcttggt ttccggggac cacaatg 37

<210> 39
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<213> Homo sapiens

<400> 39
cctctgcggc cgccagggta acatctattc cac 33

<210> 40
<211> 35
<212> DNA
<213> Mus musculus

<400> 40
ccgaagcttc caccatgaac aagtggctgt gctgc 35

<210> 41
<211> 40
<212> DNA
<213> Mus musculus

<400> 41
cctctgtcga ctattataag cagcttattt tcacggattg 40

<210> 42
<211> 21
<212> DNA
<213> Mus musculus

<400> 42
tcccttgccc tgaccactct t 21

<210> 43
<211> 35
<212> DNA
<213> Mus musculus

<400> 43
cctctgtcga cttaacacac gttgtcatgt gttgc 35

<210> 44
<211> 21
<212> DNA
<213> Mus musculus

<400> 44
tcccttgccc tgaccactct t 21

<210> 45
<211> 35
<212> DNA
<213> Mus musculus

<400> 45
cctctgtcga cttacttttg cgtggcttct ctgtt 35

<210> 46

<211> 1548
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Human sequence modified to include unique AatII and SacII sites.

<400> 46
tgcacgcatt gcatacgtac cagaggggta cgctctcatc ccttgacggt ccgtagttta 60

ttttgctttc cgagtcagct ttctgacccg gaaagcaaaa tagacaacaa acagccactt 120

gcgagaggac tcatcctgtt taggcggccc tcgcctaaac ttgcaacgct tcgttgccgg 180

gcctcccacc gcccgtcctg cgggcggtat ttgacggtcc gtagtttaat tcgtcttccg 240

gtaggactgc ctaccggaaa aacgcaaaga tgtttgagaa aacaaataaa aagatttatg 300

taagtttata cctgcagcat gaattgaaaa tttcataccc gttagttaac gaggacaatt 360

ttaacgaaat ctttatgaaa ccgtcgccaa acaacataac tcaaagtaaa cgcgtaacca 420

atttaccttt cactggcacg cgaatgatgt cggattataa aaactttata gggttctcga 480

aaaaggaagc gtacgggtgc gatttgtaag aaaaagagaa aaccaattta gcaacaaact 540

aaataataaa cgatataaat aaaaagctat taatagttga tctcttcctt gttaattacc 600

atacaagtat gtgcgtacat ttttatttga tagatatatc aacagaaaga gacttacacg 660

ttttgattcg taaggcttcg gtaataatcg tcatacttat ccctttgatt tgggtcacta 720

ttctggacta ctaaagcgaa gaaattaatg taaacctcta aaaaataaat gtcgtaacaa 780

aagtttatat aaggttaatt agccacttac taacctcaat cttattagat gatatcctag 840

tataaaataa tttaatcgca gtagtattat aacggaggta aaaaatccca ttaataggtc 900

ttaactttat agtctaaatt ggtatcttac tcctatttac tagcgctcat ttattataag 960

tgttacatgg taaaatcagt atagtctatt cgtaactaat tatagtaata acgaagatgt 1020

ccgaaattaa aataattaat aagacattca cagcagccgt aaatacagaa agtatgggta 1080

gagaaatagg aatggataac aaacagcgtt caaaacgcac aatatatagt aattttgcca 1140

ttatctaact gtaaactaag attatttaac ctaaaaacag tgtgataata tagcgaactt 1200

tatgttaaca aattgtattc atggacatcc tagcatgtcc aaatgcgttc ttttaccaaa 1260

caatatcagc taattagcta aactaagatc taaacaaaat tgattaattt cctccttatt 1320

gtataccaat tgcgcaacct taagctcgag tgatcacagc tggacgtccc atggtacctt 1380

cgaatgagct cctaggcgcc tttcttcttc ttcttcttct ttcgggcttt ccttcgactc 1440

aaccgacgac ggtggcgact cgttattgat cgtattgggg aaccccggag atttgcccag 1500

aactccccaa aaaacgactt tcctccttgg cgagaagtgc gagaagtg 1548

<210> 47
<211> 48
<212> DNA
<213> Homo sapiens

<400> 47
ccggcggaca tttatcacac agcagctgat gagaagtttc ttcatcca 48

<210> 48
<211> 55
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer

<400> 48
cgatttgatt ctagaaggag gaataacata tggttaacgc gttggaattc ggtac 55

<210> 49
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer

<400> 49
taaactaaga tcttcctcct tattgtatac caattgcgca accttaagc 49

<210> 50
<211> 1546
<212> DNA
<213> Artificial Sequence

<220>
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<222> ()..()
<223> Human sequence modified to include unique AatII and SacII sites.

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gcgtaacgta tgcatggtct ccccatgcga gagtagggaa ctgccaggca tcaaataaaa 60

cgaaaggctc agtcgaaaga ctgggccttt cgttttatct gttgtttgtc ggtgaacgct 120

ctcctgagta ggacaaatcc gccgggagcg gatttgaacg ttgcgaagca acggcccgga 180

gggtggcggg caggacgccc gccataaact gccaggcatc aaattaagca gaaggccatc 240

ctgacggatg gccttttttgc gtttctacaa actcttttgt ttatttttct aaatacattc 300

aaatatggac gtcgtactta acttttaaag tatgggcaat caattgctcc tgttaaaatt 360

gctttagaaa tactttggca gcggtttgtt gtattgagtt tcatttgcgc attggttaaa 420

tggaaagtga ccgtgcgctt actacagcct aatatttttg aaatatccca agagcttttt 480

ccttcgcatg cccacgctaa acattctttt tctcttttgg ttaaatcgtt gtttgattta 540

ttatttgcta tatttatttt tcgataatta tcaactagag aaggaacaat taatggtatg 600

ttcatacacg catgtaaaaa taaactatct atatagttgt ctttctctga atgtgcaaaa 660

ctaagcattc cgaagccatt attagcagta tgaataggga aactaaaccc agtgataaga 720

cctgatgatt tcgcttcttt aattacattt ggagattttt tatttacagc attgttttca 780

aatatattcc aattaatcgg tgaatgattg gagttagaat aatctactat aggatcatat 840

tttattaaat tagcgtcatc ataatattgc ctccattttt tagggtaatt atccagaatt 900

gaaatatcag atttaaccat agaatgagga taaatgatcg cgagtaaata atattcacaa 960

tgtaccattt tagtcatatc agataagcat tgattaatat cattattgct tctacaggct 1020

ttaattttat taattattct gtaagtgtcg tcggcattta tgtctttcat acccatctct 1080

ttatccttac ctattgtttg tcgcaagttt tgcgtgttat atatcattaa aacggtaata 1140

gattgacatt tgattctaat aaattggatt tttgtcacac tattatatcg cttgaaatac 1200

aattgtttaa cataagtacc tgtaggatcg tacaggttta cgcaagaaaa tggtttgtta 1260

tagtcgatta atcgatttga ttctagattt gttttaacta attaaaggag gaataacata 1320

tggttaacgc gttggaattc gagctcacta gtgtcgacct gcagggtacc atggaagctt 1380

actcgaggat ccgcggaaag aagaagaaga agaagaaagc ccgaaaggaa gctgagttgg 1440

ctgctgccac cgctgagcaa taactagcat aacccccttgg ggcctctaaa cgggtcttga 1500

ggggtttttt gctgaaagga ggaaccgctc ttcacgctct tcacgc 1546

<210> 51
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 51
tatgaaacat catcaccatc accatcatgc tagcgttaac gcgttgg 47

<210> 52
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 52
actttgtagt agtggtagtg gtagtacgat cgcaattgcg caaccttaa 49

<210> 53
<211> 141
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 53
ctaattccga tctcacctac caaacaatgc ccccctgcaa aaaataaatt catataaaaa 60

acatacagat aaccatctgc ggtgataaat tatctctggc ggtgttgaca taaataccac 120

tggcggtgat actgagcaca t 141

<210> 54
<211> 147
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 54
tgcagattaa ggcgagagtg gatggtttgt tacgggggga cgtttttttat ttaagtatat 60

tttttgtatg tctattggta gacgccacta tttaatagag accgccacaa ctgtatttat 120

ggtgaccgcc actatgactc gtgtagc 147

<210> 55
<211> 55
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 55
cgatttgatt ctagaaggag gaataacata tggttaacgc gttggaattc ggtac 55

<210> 56
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 56
taaactaaga tcttcctcct tattgtatac caattgcgca accttaagc 49

<210> 57
<211> 668
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 57
tgcacgcatt gcatacgtac cagaggggta cgctctcatc ccttgacggt ccgtagttta 60

ttttgctttc cgagtcagct ttctgacccg gaaagcaaaa tagacaacaa acagccactt 120

gcgagaggac tcatcctgtt taggcggccc tcgcctaaac ttgcaacgct tcgttgccgg 180

gcctcccacc gcccgtcctg cgggcggtat ttgacggtcc gtagtttaat tcgtcttccg 240

gtaggactgc ctaccggaaa aacgcaaaga tgtttgagaa aacaaataaa aagatttatg 300

taagtttata cctgcagagt attaaaaatt ttttaagtaa actgtttacg attttaagaa 360

ctaattataa gagttaacac tcgcgagtgt taaatagcta aactaagatc taaactcaat 420

tgattaattt cctccttatt gtataccaat tgcgcaacct taagctcgag tgatcacagc 480

tggacgtccc atggtacctt cgaatgagct cctaggcgcc tttcttcttc ttcttcttct 540

ttcgggcttt ccttcgactc aaccgacgac ggtggcgact cgttattgat cgtattgggg 600

aaccccggag atttgcccag aactccccaa aaaacgactt tcctccttgg cgagaagtgc 660

gagaagtg 668

<210> 58
<211> 726
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 58
gcgtaacgta tgcatggtct ccccatgcga gagtagggaa ctgccaggca tcaaataaaa 60

cgaaaggctc agtcgaaaga ctgggccttt cgttttatct gttgtttgtc ggtgaacgct 120

ctcctgagta ggacaaatcc gccgggagcg gatttgaacg ttgcgaagca acggcccgga 180

gggtggcggg caggacgccc gccataaact gccaggcatc aaattaagca gaaggggcct 240

cccaccgccc gtcctgcggg cggtatttga cggtccgtag tttaattcgt cttcgccatc 300

ctgacggatg gccttttgc gtttctacaa actcttttgt ttatttttct aaatacattc 360

aaatatggac gtctcataat ttttaaaaaa ttcatttgac aaatgctaaa attcttgatt 420

aatattctca attgtgagcg ctcacaattt atcgatttga ttctagattt gttttaacta 480

attaaaggag gaataacata tggttaacgc gttggaattc gagctcacta gtgtcgacct 540

gcagggtacc atggaagctt actcgaggat ccgcggaaag aagaagaaga agaagaaagc 600

ccgaaaggaa gctgagttgg ctgctgccac cgctgagcaa taactagcat aacccttgg 660

ggcctctaaa cgggtcttga ggggtttttt gctgaaagga ggaaccgctc ttcacgctct 720

tcacgc 726

<210> 59
<211> 44
<212> DNA
<213> Homo sapiens

<400> 59

tacgcactgg atccttataa gcagcttatt tttactgatt ggac 44

<210> 60
<211> 27
<212> DNA
<213> Homo sapiens

<400> 60
gtcctcctgg tacctaccta aaacaac 27

<210> 61
<211> 54
<212> DNA
<213> Homo sapiens

<400> 61
tatggatgaa gaaacttctc atcagctgct gtgtgataaa tgtccgccgg gtac 54

<210> 62
<211> 19
<212> PRT
<213> Homo sapiens

<400> 62

Met Asp Glu Glu Thr Ser His Gln Leu Leu Cys Asp Lys Cys Pro Pro
1 5 10 15

Gly Thr Tyr

<210> 63
<211> 84
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Sequence used in vector formation using human sequence with E.

coli codons.

<400> 63
tatggaaact tttcctccaa aatatcttca ttatgatgaa gaaacttctc atcagctgct 60

gtgtgataaa tgtccgccgg gtac 84

<210> 64
<211> 78
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Sequence used in vector formation using human sequence with E. coli codons.

<400> 64
ccggcggaca tttatcacac agcagctgat gagaagtttc ttcatcataa tgaagatatt 60

ttggaggaaa agtttcca 78

<210> 65
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer

<400> 65
tacgcactgg atccttataa gcagcttatt ttcacggatt gaac 44

<210> 66
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer

<400> 66
gtgctcctgg tacctaccta aaacagcact gcacagtg 38

<210> 67
<211> 84
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 67
tatggaaact ctgcctccaa aatacctgca ttacgatccg gaaactggtc atcagctgct 60

gtgtgataaa tgtgctccgg gtac 84

<210> 68
<211> 78
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 68
ccggagcaca tttatcacac agcagctgat gaccagtttc cggatcgtaa tgcaggtatt 60

ttggaggcag agtttcca 78

<210> 69
<211> 54
<212> DNA
<213> Mus musculus

<400> 69
tatggaccca gaaactggtc atcagctgct gtgtgataaa tgtgctccgg gtac 54

<210> 70
<211> 48
<212> DNA
<213> Mus musculus

<400> 70
ccggagcaca tttatcacac agcagctgat gaccagtttc tgggtcca 48

<210> 71
<211> 87
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 71
tatgaaagaa actctgcctc caaaatacct gcattacgat ccggaaactg gtcatcagct 60

gctgtgtgat aaatgtgctc cgggtac 87

<210> 72
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 72
ccggagcaca tttatcacac agcagctgat gaccagtttc cggatcgtaa tgcaggtatt 60

ttggaggcag agtttctttc a 81

<210> 73
<211> 71
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer

<400> 73
gttctcctca tatgaaacat catcaccatc accatcatga aactctgcct ccaaaatacc 60

tgcattacga t 71

<210> 74
<211> 43
<212> DNA
<213> Mus musculus

<400> 74
gttctcctca tatgaaagaa actctgcctc caaaatacct gca 43

<210> 75
<211> 76
<212> DNA
<213> Mus musculus

<400> 75
tacgcactgg atccttaatg atggtgatgg tgatgatgta agcagcttat tttcacggat 60

tgaacctgat tcccta 76

<210> 76
<211> 47
<212> DNA
<213> Mus musculus

<400> 76
gttctcctca tatgaaatac ctgcattacg atccggaaac tggtcat 47

<210> 77
<211> 43
<212> DNA
<213> Homo sapiens

<400> 77
gttctcctat taatgaaata tcttcattat gatgaagaaa ctt 43

<210> 78
<211> 40
<212> DNA
<213> Homo sapiens

<400> 78
tacgcactgg atccttataa gcagcttatt tttactgatt 40

<210> 79
<211> 40
<212> DNA
<213> Mus musculus

<400> 79
gttctcctca tatggaaact ctgcctccaa aatacctgca 40

<210> 80
<211> 43
<212> DNA
<213> Mus musculus

<400> 80
tacgcactgg atccttatgt tgcatttcct ttctgaatta gca 43

<210> 81
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 81
ccggaaacag ataatgag 18

<210> 82
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 82
gatcctcatt atctgttt 18

<210> 83
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 83
ccggaaacag agaagccacg caaaagtaag 30

<210> 84
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 84
gatccttact tttgcgtggc ttctctgttt 30

<210> 85
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 85
tatgttaatg ag 12

<210> 86
<211> 14
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 86
gatcctcatt aaca 14

<210> 87
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 87
tatgttccgg aaacagttaa g 21

<210> 88
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 88
gatccttaac tgtttccgga aca 23

<210> 89
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 89
tatgttccgg aaacagtgaa tcaactcaaa aataag 36

<210> 90
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 90
gatccttatt tttgagttga ttcactgttt ccggaaca 38

<210> 91
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 91
ctagcgacga cgacgacaaa gaaactctgc ctccaaaata cctgcattac gatccggaaa 60

ctggtcatca gctgctgtgt cataaatgtg ctccgggtac 100

<210> 92
<211> 92
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Part of oligonucleotide duplex used in vector formation.

<400> 92
ccggagcaca tttatcacac agcagctgat gaccagtttc cggatcgtaa tgcaggtatt 60

ttggaggcag agtttctttg tcgtcgtcgt cg 92

<210> 93
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Used to produce fusion protein with human OPG.

<400> 93
acaaacacaa tcgatttgat actaga 26

<210> 94

<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Used to produce fusion protein with human OPG.

<400> 94
tttgttttaa ctaattaaag gaggaataaa atatgagagg atcgcatcac 50

<210> 95
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Used to produce fusion protein with human OPG.

<400> 95
catcaccatc acgaaacctt cccgccgaaa tacctgcact acgacgaaga 50

<210> 96
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Used to produce fusion protein with human OPG.

<400> 96
aacctcccac cagctgctgt gcgacaaatg cccgccgggt acccaaaca 49

<210> 97
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Used to produce fusion protein with human OPG.

<400> 97
tgtttgggta cccggcgggc atttgt 26

<210> 98

<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Used to produce fusion protein with human OPG.

<400> 98
cgcacagcag ctggtgggag gtttcttcgt cgtagtgcag gtatttcggc 50

<210> 99
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Used to produce fusion protein with human OPG.

<400> 99
gggaaggttt cgtgatggtg atggtgatgc catcctctca tattttatt 49

<210> 100
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Used to produce fusion protein with human OPG.

<400> 100
cctcctttaa ttagttaaaa caaatctagt atcaaatcga ttgtgtttgt 50

<210> 101
<211> 59
<212> DNA
<213> Homo sapiens

<400> 101
acaaacacaa tcgatttgat actagatttg ttttaactaa ttaaaggagg aataaaatg 59

<210> 102
<211> 48
<212> DNA
<213> Homo sapiens

<400> 102

ctaattaaag gaggaataaa atgaaagaaa cttttcctcc aaaatatc 48

<210> 103
<211> 31
<212> DNA
<213> Homo sapiens

<400> 103
tgtttgggta cccggcggac atttatcaca c 31

<210> 104
<211> 59
<212> DNA
<213> Homo sapiens

<400> 104
acaaacacaa tcgatttgat actagatttg ttttaactaa ttaaaggagg aataaaatg 59

<210> 105
<211> 54
<212> DNA
<213> Homo sapiens

<400> 105
ctaattaaag gaggaataaa atgaaaaaaa aagaaacttt tcctccaaaa tatc 54

<210> 106
<211> 31
<212> DNA
<213> Homo sapiens

<400> 106
tgtttgggta cccggcggac atttatcaca c 31

<210> 107
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for FchOPG fusion protein.

<400> 107
cagcccgggt aaaatggaaa cgtttcctcc aaaatatctt catt 44

<210> 108
<211> 44
<212> DNA

<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for FchOPG fusion protein.

<400> 108
cgtttccatt ttacccgggc tgagcgagag gctcttctgc gtgt 44

<210> 109
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for FcmuOPG fusion protein.

<400> 109
cgctcagccc gggtaaaatg gaaacgttgc ctccaaaata cctgc 45

<210> 110
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for FcmuOPG fusion protein.

<400> 110
ccattttacc cgggctgagc gagaggctct tctgcgtgt 39

<210> 111
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for muOPG-Fc fusion protein.

<400> 111
gaaaataaga tgcttagctg cagctgaacc aaaatc 36

<210> 112
<211> 34
<212> DNA

<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for muOPG-Fc fusion protein.

<400> 112
cagctgcagc taagcagctt attttcacgg attg 34

<210> 113
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for huOPG-Fc fusion protein.

<400> 113
aaaaataagc tgcttagctg cagctgaacc aaaatc 36

<210> 114
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for huOPG-Fc fusion protein.

<400> 114
cagctgcagc taagcagctt atttttactg attgg 35

<210> 115
<211> 102
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Linker with XbaI and KpnI sites inserted into human sequence.

<400> 115
ctagaaggag gaataacata tggaaacttt tgctccaaaa tatcttcatt atgatgaaga 60

aactagtcat cagctgctgt gtgataaatg tccgccgggt ac 102

<210> 116

<211> 94
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Linker with XbaI and KpnI sites inserted into human sequence.

<400> 116
ccggcggaca tttatcacac agcagctgat gactagtttc ttcatcataa tgaagatatt 60

ttggagcaaa agtttccata tgttattcct cctt 94

<210> 117
<211> 62
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Linker with XbaI and SpeI sites inserted into human sequence.

<400> 117
ctagaaggag gaataacata tggaaacttt tcctgctaaa tatcttcatt atgatgaaga 60

aa 62

<210> 118
<211> 62
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Linker with XbaI and SpeI sites inserted into human sequence.

<400> 118
ctagtttctt catcataatg aagatattta gcaggaaaag tttccatatg ttattcctcc 60

tt 62

<210> 119
<211> 51
<212> PRT
<213> Homo sapiens

<400> 119

Tyr His Tyr Tyr Asp Gln Asn Gly Arg Met Cys Glu Glu Cys His Met
1 5 10 15

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Cys Gln Pro Gly His Phe Leu Val Lys His Cys Lys Gln Pro Lys Arg
            20                  25                  30

Asp Thr Val Cys His Lys Pro Cys Glu Pro Gly Val Thr Tyr Thr Asp
        35                  40                  45

Asp Trp His
    50

<210>  120
<211>  2432
<212>  DNA
<213>  Rattus rattus

<220>
<221>  CDS
<222>  (124)..(1326)

<400>  120
atcaaaggca gggcatactt cctgttgccc agaccttata taaaacgtca tgttcgcctg     60

ggcagcagag aagcacctag cactggccca gcggctgccg cctgaggttt ccagaggacc    120

aca atg aac aag tgg ctg tgc tgt gca ctc ctg gtg ttc ttg gac atc      168
    Met Asn Lys Trp Leu Cys Cys Ala Leu Leu Val Phe Leu Asp Ile
    1               5                   10                  15

att gaa tgg aca acc cag gaa acc ttt cct cca aaa tac ttg cat tat      216
Ile Glu Trp Thr Thr Gln Glu Thr Phe Pro Pro Lys Tyr Leu His Tyr
                20                  25                  30

gac cca gaa acc gga cgt cag ctc ttg tgt gac aaa tgt gct cct ggc      264
Asp Pro Glu Thr Gly Arg Gln Leu Leu Cys Asp Lys Cys Ala Pro Gly
            35                  40                  45

acc tac cta aaa cag cac tgc aca gtc agg agg aag aca ctg tgt gtc      312
Thr Tyr Leu Lys Gln His Cys Thr Val Arg Arg Lys Thr Leu Cys Val
        50                  55                  60

cct tgc cct gac tac tct tat aca gac agc tgg cac acg agt gat gaa      360
Pro Cys Pro Asp Tyr Ser Tyr Thr Asp Ser Trp His Thr Ser Asp Glu
    65                  70                  75

tgc gtg tac tgc agc ccc gtg tgc aag gaa ctg cag acc gtg aaa cag      408
Cys Val Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Thr Val Lys Gln
80                  85                  90                  95

gag tgc aac cgc acc cac aac cga gtg tgc gaa tgt gag gaa ggg cgc      456
Glu Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Glu Glu Gly Arg
                100                 105                 110

tac ctg gag ctc gaa ttc tgc ttg aag cac cgg agc tgt ccc cca ggc      504
Tyr Leu Glu Leu Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly
            115                 120                 125
```

```
ttg ggt gtg ctg cag gct ggg acc cca gag cga aac acg gtt tgc aaa      552
Leu Gly Val Leu Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys
        130                 135                 140

aga tgt ccg gat ggg ttc ttc tca ggt gag acg tca tcg aaa gca ccc      600
Arg Cys Pro Asp Gly Phe Phe Ser Gly Glu Thr Ser Ser Lys Ala Pro
    145                 150                 155

tgt agg aaa cac acc aac tgc agc tca ctt ggc ctc ctg cta att cag      648
Cys Arg Lys His Thr Asn Cys Ser Ser Leu Gly Leu Leu Leu Ile Gln
160                 165                 170                 175

aaa gga aat gca aca cat gac aat gta tgt tcc gga aac aga gaa gca      696
Lys Gly Asn Ala Thr His Asp Asn Val Cys Ser Gly Asn Arg Glu Ala
                180                 185                 190

act caa aat tgt gaa ata gat gtc acc ctg tgc gaa gag gca ttc ttc      744
Thr Gln Asn Cys Glu Ile Asp Val Thr Leu Cys Glu Glu Ala Phe Phe
            195                 200                 205

agg ttt gct gtg cct acc aag att ata ccg aat tgg ctg agt gtt ctg      792
Arg Phe Ala Val Pro Thr Lys Ile Ile Pro Asn Trp Leu Ser Val Leu
        210                 215                 220

gtg gac agt ttg cct ggg acc aaa gtg aat gca gag agt gta gag agg      840
Val Asp Ser Leu Pro Gly Thr Lys Val Asn Ala Glu Ser Val Glu Arg
    225                 230                 235

ata aaa cgg aga cac agc tcg caa gag caa act ttc cag cta ctt aag      888
Ile Lys Arg Arg His Ser Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys
240                 245                 250                 255

ctg tgg aag cat caa aac aga gac cag gaa atg gtg aag aag atc atc      936
Leu Trp Lys His Gln Asn Arg Asp Gln Glu Met Val Lys Lys Ile Ile
                260                 265                 270

caa gac att gac ctc tgt gaa agc agt gtg caa cgg cat atc ggc cac      984
Gln Asp Ile Asp Leu Cys Glu Ser Ser Val Gln Arg His Ile Gly His
            275                 280                 285

gcg aac ctc acc aca gag cag ctc cgc atc ttg atg gag agc ttg cct     1032
Ala Asn Leu Thr Thr Glu Gln Leu Arg Ile Leu Met Glu Ser Leu Pro
        290                 295                 300

ggg aag aag atc agc cca gac gag att gag aga acg aga aag acc tgc     1080
Gly Lys Lys Ile Ser Pro Asp Glu Ile Glu Arg Thr Arg Lys Thr Cys
    305                 310                 315

aaa ccc agc gag cag ctc ctg aag cta ctg agc ttg tgg agg atc aaa     1128
Lys Pro Ser Glu Gln Leu Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys
320                 325                 330                 335

aat gga gac caa gac acc ttg aag ggc ctg atg tac gca ctc aag cac     1176
Asn Gly Asp Gln Asp Thr Leu Lys Gly Leu Met Tyr Ala Leu Lys His
                340                 345                 350
```

```
ttg aaa gca tac cac ttt ccc aaa acc gtc acc cac agt ctg agg aag     1224
Leu Lys Ala Tyr His Phe Pro Lys Thr Val Thr His Ser Leu Arg Lys
            355                 360                 365

acc atc agg ttc ttg cac agc ttc acc atg tac cga ttg tat cag aaa     1272
Thr Ile Arg Phe Leu His Ser Phe Thr Met Tyr Arg Leu Tyr Gln Lys
        370                 375                 380

ctc ttt cta gaa atg ata ggg aat cag gtt caa tca gtg aag ata agc     1320
Leu Phe Leu Glu Met Ile Gly Asn Gln Val Gln Ser Val Lys Ile Ser
    385                 390                 395

tgc tta tagttaggaa tggtcactgg gctgtttctt caggatgggc caacactgat     1376
Cys Leu
400

ggagcagatg gctgcttctc cggctcttga aatggcagtt gattcctttc tcatcagttg   1436

gtgggaatga agatcctcca gcccaacaca cactgggg agtctgagtc aggagagtga   1496

ggcaggctat ttgataattg tgcaaagctg ccaggtgtac acctagaaag tcaagcaccc   1556

tgagaaagag gatattttta taacctcaaa cataggccct ttccttcctc tccttatgga   1616

tgagtactca gaaggcttct actatcttct gtgtcatccc tagatgaagg cctcttttat   1676

ttatttttt attcttttt tcggagctgg ggaccgaacc cagggccttg cgcttgcgag   1736

gcaagtgctc taccactgag ctaaatctcc aacccctgaa ggcctctttc tttctgcctc   1796

tgatagtcta tgacattctt ttttctacaa ttcgtatcag gtgcacgagc cttatcccat   1856

ttgtaggttt ctaggcaagt tgaccgttag ctatttttcc ctctgaagat ttgattcgag   1916

ttgcagactt ggctagacaa gcaggggtag gttatggtag tttatttaac agactgccac   1976

caggagtcca gtgtttcttg ttcctctgta gttgtaccta agctgactcc aagtacattt   2036

agtatgaaaa ataatcaaca aattttattc cttctatcaa cattggctag ctttgtttca   2096

gggcactaaa agaaactact atatggagaa agaattgata ttgcccccaa cgttcaacaa   2156

cccaatagtt tatccagctg tcatgcctgg ttcagtgtct actgactatg cgccctctta   2216

ttactgcatg cagtaattca actggaaata gtaataataa taatagaaat aaaatctaga   2276

ctccattgga tctctctgaa tatgggaata tctaacttaa gaagctttga gatttcagtt   2336

gtgttaaagg cttttattaa aaagctgatg ctcttctgta aaagttacta atatatctgt   2396

aagactatta cagtattgct atttatatcc atccag                             2432
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<210> 121
<211> 401
<212> PRT

<213> Rattus rattus

<400> 121

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Met Asn Lys Trp Leu Cys Cys Ala Leu Leu Val Phe Leu Asp Ile Ile
1               5                  10                  15

Glu Trp Thr Thr Gln Glu Thr Phe Pro Pro Lys Tyr Leu His Tyr Asp
            20                  25                  30

Pro Glu Thr Gly Arg Gln Leu Leu Cys Asp Lys Cys Ala Pro Gly Thr
        35                  40                  45

Tyr Leu Lys Gln His Cys Thr Val Arg Arg Lys Thr Leu Cys Val Pro
    50                  55                  60

Cys Pro Asp Tyr Ser Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys
65                  70                  75                  80

Val Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Thr Val Lys Gln Glu
                85                  90                  95

Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Glu Glu Gly Arg Tyr
            100                 105                 110

Leu Glu Leu Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly Leu
        115                 120                 125

Gly Val Leu Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Arg
    130                 135                 140

Cys Pro Asp Gly Phe Phe Ser Gly Glu Thr Ser Ser Lys Ala Pro Cys
145                 150                 155                 160

Arg Lys His Thr Asn Cys Ser Ser Leu Gly Leu Leu Leu Ile Gln Lys
                165                 170                 175

Gly Asn Ala Thr His Asp Asn Val Cys Ser Gly Asn Arg Glu Ala Thr
            180                 185                 190

Gln Asn Cys Glu Ile Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg
        195                 200                 205
```

```
Phe Ala Val Pro Thr Lys Ile Ile Pro Asn Trp Leu Ser Val Leu Val
    210                 215                 220

Asp Ser Leu Pro Gly Thr Lys Val Asn Ala Glu Ser Val Glu Arg Ile
225                 230                 235                 240

Lys Arg Arg His Ser Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys Leu
                245                 250                 255

Trp Lys His Gln Asn Arg Asp Gln Glu Met Val Lys Lys Ile Ile Gln
            260                 265                 270

Asp Ile Asp Leu Cys Glu Ser Ser Val Gln Arg His Ile Gly His Ala
        275                 280                 285

Asn Leu Thr Thr Glu Gln Leu Arg Ile Leu Met Glu Ser Leu Pro Gly
    290                 295                 300

Lys Lys Ile Ser Pro Asp Glu Ile Glu Arg Thr Arg Lys Thr Cys Lys
305                 310                 315                 320

Pro Ser Glu Gln Leu Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys Asn
                325                 330                 335

Gly Asp Gln Asp Thr Leu Lys Gly Leu Met Tyr Ala Leu Lys His Leu
            340                 345                 350

Lys Ala Tyr His Phe Pro Lys Thr Val Thr His Ser Leu Arg Lys Thr
        355                 360                 365

Ile Arg Phe Leu His Ser Phe Thr Met Tyr Arg Leu Tyr Gln Lys Leu
    370                 375                 380

Phe Leu Glu Met Ile Gly Asn Gln Val Gln Ser Val Lys Ile Ser Cys
385                 390                 395                 400

Leu
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<210> 122
<211> 1325
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (91)..(1293)
<220>
<221> misc_feature
<222> ()..()
<223> At position 11, R is a purine.

<400> 122
ccttatataa racgtcatga ttgcctgggc tgcagagacg cacctagcac tgacccagcg 60

gctgcctcct gaggtttccc gaggaccaca atg aac aag tgg ctg tgc tgc gca 114
Met Asn Lys Trp Leu Cys Cys Ala
1 5

ctc ctg gtg ctc ctg gac atc att gaa tgg aca acc cag gaa acc ctt 162
Leu Leu Val Leu Leu Asp Ile Ile Glu Trp Thr Thr Gln Glu Thr Leu
10 15 20

ctt cca aag tac ttg cat tat gac cca gaa act ggt cat cag ctc ctg 210
Leu Pro Lys Tyr Leu His Tyr Asp Pro Glu Thr Gly His Gln Leu Leu
25 30 35 40

tgt gac aaa tgt gct cct ggc acc tac cta aaa cag cac tgc aca gtg 258
Cys Asp Lys Cys Ala Pro Gly Thr Tyr Leu Lys Gln His Cys Thr Val
45 50 55

agg agg aag aca ttg tgt gtc cct tgc cct gac cac tct tat acg gac 306
Arg Arg Lys Thr Leu Cys Val Pro Cys Pro Asp His Ser Tyr Thr Asp
60 65 70

agc tgg cac acc agt gat gag tgt gtg tat tgc agc cca gtg tgc aag 354
Ser Trp His Thr Ser Asp Glu Cys Val Tyr Cys Ser Pro Val Cys Lys
75 80 85

gaa ctg cag tcc gtg aag cag gag tgc aac cgc acc cac aac cga gtg 402
Glu Leu Gln Ser Val Lys Gln Glu Cys Asn Arg Thr His Asn Arg Val
90 95 100

tgt gag tgt gag gaa ggg cgt tac ctg gag atc gaa ttc tgc ttg aag 450
Cys Glu Cys Glu Glu Gly Arg Tyr Leu Glu Ile Glu Phe Cys Leu Lys
105 110 115 120

cac cgg agc tgt ccc ccg ggc tcc ggc gtg gtg caa gct gga acc cca 498
His Arg Ser Cys Pro Pro Gly Ser Gly Val Val Gln Ala Gly Thr Pro
125 130 135

gag cga aac aca gtt tgc aaa aaa tgt cca gat ggg ttc ttc tca ggt 546
Glu Arg Asn Thr Val Cys Lys Lys Cys Pro Asp Gly Phe Phe Ser Gly
140 145 150

gag act tca tcg aaa gca ccc tgt ata aaa cac acg aac tgc agc aca 594
Glu Thr Ser Ser Lys Ala Pro Cys Ile Lys His Thr Asn Cys Ser Thr
155 160 165

```
ttt ggc ctc ctg cta att cag aaa gga aat gca aca cat gac aac tgt      642
Phe Gly Leu Leu Leu Ile Gln Lys Gly Asn Ala Thr His Asp Asn Cys
    170                 175                 180

tgt tcc gga aac aga gaa gcc acg caa aag tgt gga ata gat gtc acc      690
Cys Ser Gly Asn Arg Glu Ala Thr Gln Lys Cys Gly Ile Asp Val Thr
185                 190                 195                 200

ctg tgt gaa gag gcc ttc ttc agg ttt gct gtt cct acc aag att ata      738
Leu Cys Glu Glu Ala Phe Phe Arg Phe Ala Val Pro Thr Lys Ile Ile
                205                 210                 215

cca aat tgg ctg agt gtt ttg gtg gac agt ttg cct ggg acc aaa gtg      786
Pro Asn Trp Leu Ser Val Leu Val Asp Ser Leu Pro Gly Thr Lys Val
            220                 225                 230

aat gcc gag agt gta gag agg ata aaa cgg aga cac agc tca caa gag      834
Asn Ala Glu Ser Val Glu Arg Ile Lys Arg Arg His Ser Ser Gln Glu
        235                 240                 245

caa acc ttc cag ctg ctg aag ctg tgg aaa cat caa aac aga gac cag      882
Gln Thr Phe Gln Leu Leu Lys Leu Trp Lys His Gln Asn Arg Asp Gln
    250                 255                 260

gaa atg gtg aag aag atc atc caa gac att gac ctc tgt gaa agc agc      930
Glu Met Val Lys Lys Ile Ile Gln Asp Ile Asp Leu Cys Glu Ser Ser
265                 270                 275                 280

gtg cag cgg cat ctc ggc cac tcg aac ctc acc aca gag cag ctt ctt      978
Val Gln Arg His Leu Gly His Ser Asn Leu Thr Thr Glu Gln Leu Leu
                285                 290                 295

gcc ttg atg gag agc ctg cct ggg aag aag atc agc cca gaa gag att     1026
Ala Leu Met Glu Ser Leu Pro Gly Lys Lys Ile Ser Pro Glu Glu Ile
            300                 305                 310

gag aga acg aga aag acc tgc aaa tcg agc gag cag ctc ctg aag cta     1074
Glu Arg Thr Arg Lys Thr Cys Lys Ser Ser Glu Gln Leu Leu Lys Leu
        315                 320                 325

ctc agt tta tgg agg atc aaa aat ggt gac caa gac acc ttg aag ggc     1122
Leu Ser Leu Trp Arg Ile Lys Asn Gly Asp Gln Asp Thr Leu Lys Gly
    330                 335                 340

ctg atg tat gcc ctc aag cac ttg aaa aca tcc cac ttt ccc aaa act     1170
Leu Met Tyr Ala Leu Lys His Leu Lys Thr Ser His Phe Pro Lys Thr
345                 350                 355                 360

gtc acc cac agt ctg agg aag acc atg agg ttc ctg cac agc ttc aca     1218
Val Thr His Ser Leu Arg Lys Thr Met Arg Phe Leu His Ser Phe Thr
                365                 370                 375

atg tac aga ctg tat cag aag ctc ttt tta gaa atg ata ggg aat cag     1266
Met Tyr Arg Leu Tyr Gln Lys Leu Phe Leu Glu Met Ile Gly Asn Gln
            380                 385                 390
```

```
gtt caa tcc gtg aaa ata agc tgc tta taactaggaa tggtcactgg          1313
Val Gln Ser Val Lys Ile Ser Cys Leu
        395                 400

gctgtttctt ca                                                      1325


<210>  123
<211>  401
<212>  PRT
<213>  Mus musculus

<220>
<221>  misc_feature
<222>  ()..()
<223>  At position 11, R is a purine.

<400>  123

Met Asn Lys Trp Leu Cys Cys Ala Leu Leu Val Leu Leu Asp Ile Ile
1               5                  10                  15


Glu Trp Thr Thr Gln Glu Thr Leu Leu Pro Lys Tyr Leu His Tyr Asp
            20                  25                  30


Pro Glu Thr Gly His Gln Leu Leu Cys Asp Lys Cys Ala Pro Gly Thr
        35                  40                  45


Tyr Leu Lys Gln His Cys Thr Val Arg Arg Lys Thr Leu Cys Val Pro
    50                  55                  60


Cys Pro Asp His Ser Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys
65                  70                  75                  80


Val Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Ser Val Lys Gln Glu
                85                  90                  95


Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Glu Glu Gly Arg Tyr
            100                 105                 110


Leu Glu Ile Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly Ser
        115                 120                 125


Gly Val Val Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Lys
    130                 135                 140


Cys Pro Asp Gly Phe Phe Ser Gly Glu Thr Ser Ser Lys Ala Pro Cys
```

```
145                 150                 155                 160

Ile Lys His Thr Asn Cys Ser Thr Phe Gly Leu Leu Leu Ile Gln Lys
                165                 170                 175

Gly Asn Ala Thr His Asp Asn Cys Cys Ser Gly Asn Arg Glu Ala Thr
            180                 185                 190

Gln Lys Cys Gly Ile Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg
        195                 200                 205

Phe Ala Val Pro Thr Lys Ile Ile Pro Asn Trp Leu Ser Val Leu Val
    210                 215                 220

Asp Ser Leu Pro Gly Thr Lys Val Asn Ala Glu Ser Val Glu Arg Ile
225                 230                 235                 240

Lys Arg Arg His Ser Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys Leu
                245                 250                 255

Trp Lys His Gln Asn Arg Asp Gln Glu Met Val Lys Lys Ile Ile Gln
            260                 265                 270

Asp Ile Asp Leu Cys Glu Ser Ser Val Gln Arg His Leu Gly His Ser
        275                 280                 285

Asn Leu Thr Thr Glu Gln Leu Leu Ala Leu Met Glu Ser Leu Pro Gly
    290                 295                 300

Lys Lys Ile Ser Pro Glu Glu Ile Glu Arg Thr Arg Lys Thr Cys Lys
305                 310                 315                 320

Ser Ser Glu Gln Leu Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys Asn
                325                 330                 335

Gly Asp Gln Asp Thr Leu Lys Gly Leu Met Tyr Ala Leu Lys His Leu
            340                 345                 350

Lys Thr Ser His Phe Pro Lys Thr Val Thr His Ser Leu Arg Lys Thr
        355                 360                 365

Met Arg Phe Leu His Ser Phe Thr Met Tyr Arg Leu Tyr Gln Lys Leu
```

```
    370                 375                 380

Phe Leu Glu Met Ile Gly Asn Gln Val Gln Ser Val Lys Ile Ser Cys
385                 390                 395                 400

Leu
```

<210> 124
<211> 1356
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (95)..(1297)

<220>
<221> misc_feature
<222> ()..()
<223> At position 63, Y is a pyrimidine.

<400> 124

```
gtatatataa cgtgatgagc gtacgggtgc ggagacgcac cggcgcgctc gcccagccgc     60

cgyctccaag cccctgaggt ttccggggac caca atg aac aag ttg ctg tgc tgc     115
                                       Met Asn Lys Leu Leu Cys Cys
                                       1               5

gcg ctc gtg ttt ctg gac atc tcc att aag tgg acc acc cag gaa acg       163
Ala Leu Val Phe Leu Asp Ile Ser Ile Lys Trp Thr Thr Gln Glu Thr
        10                  15                  20

ttt cct cca aag tac ctt cat tat gac gaa gaa acc tct cat cag ctg       211
Phe Pro Pro Lys Tyr Leu His Tyr Asp Glu Glu Thr Ser His Gln Leu
    25                  30                  35

ttg tgt gac aaa tgt cct cct ggt acc tac cta aaa caa cac tgt aca       259
Leu Cys Asp Lys Cys Pro Pro Gly Thr Tyr Leu Lys Gln His Cys Thr
40                  45                  50                  55

gca aag tgg aag tcc gtg tgc gcc cct tgc cct gac cac tac tac aca       307
Ala Lys Trp Lys Ser Val Cys Ala Pro Cys Pro Asp His Tyr Tyr Thr
                60                  65                  70

gac agc tgg cac acc agt gac gag tgt cta tac tgc agc ccc gtg tgc       355
Asp Ser Trp His Thr Ser Asp Glu Cys Leu Tyr Cys Ser Pro Val Cys
            75                  80                  85

aag gag ctg cag tac gtc aag cag gag tgc aat cgc acc cac aac cgc       403
Lys Glu Leu Gln Tyr Val Lys Gln Glu Cys Asn Arg Thr His Asn Arg
        90                  95                  100
```

```
gtg tgc gaa tgc aag gaa ggg cgc tac ctt gag ata gag ttc tgc ttg      451
Val Cys Glu Cys Lys Glu Gly Arg Tyr Leu Glu Ile Glu Phe Cys Leu
    105                 110                 115

aaa cat agg agc tgc cct cct gga ttt gga gtg gtg caa gct gga acc      499
Lys His Arg Ser Cys Pro Pro Gly Phe Gly Val Val Gln Ala Gly Thr
120                 125                 130                 135

cca gag cga aat aca gtt tgc aaa aga tgt cca gat ggg ttc ttc tca      547
Pro Glu Arg Asn Thr Val Cys Lys Arg Cys Pro Asp Gly Phe Phe Ser
                140                 145                 150

aat gag acg tca tct aaa gca ccc tgt aga aaa cac aca aat tgc agt      595
Asn Glu Thr Ser Ser Lys Ala Pro Cys Arg Lys His Thr Asn Cys Ser
            155                 160                 165

gtc ttt ggt ctc ctg cta act cag aaa gga aat gca aca cac gac aac      643
Val Phe Gly Leu Leu Leu Thr Gln Lys Gly Asn Ala Thr His Asp Asn
        170                 175                 180

ata tgt tcc gga aac agt gaa tca act caa aaa tgt gga ata gat gtt      691
Ile Cys Ser Gly Asn Ser Glu Ser Thr Gln Lys Cys Gly Ile Asp Val
    185                 190                 195

acc ctg tgt gag gag gca ttc ttc agg ttt gct gtt cct aca aag ttt      739
Thr Leu Cys Glu Glu Ala Phe Phe Arg Phe Ala Val Pro Thr Lys Phe
200                 205                 210                 215


acg cct aac tgg ctt agt gtc ttg gta gac aat ttg cct ggc acc aaa      787
Thr Pro Asn Trp Leu Ser Val Leu Val Asp Asn Leu Pro Gly Thr Lys
                220                 225                 230

gta aac gca gag agt gta gag agg ata aaa cgg caa cac agc tca caa      835
Val Asn Ala Glu Ser Val Glu Arg Ile Lys Arg Gln His Ser Ser Gln
            235                 240                 245

gaa cag act ttc cag ctg ctg aag tta tgg aaa cat caa aac aaa gcc      883
Glu Gln Thr Phe Gln Leu Leu Lys Leu Trp Lys His Gln Asn Lys Ala
        250                 255                 260

caa gat ata gtc aag aag atc atc caa gat att gac ctc tgt gaa aac      931
Gln Asp Ile Val Lys Lys Ile Ile Gln Asp Ile Asp Leu Cys Glu Asn
    265                 270                 275

agc gtg cag cgg cac att gga cat gct aac ctc acc ttc gag cag ctt      979
Ser Val Gln Arg His Ile Gly His Ala Asn Leu Thr Phe Glu Gln Leu
280                 285                 290                 295

cgt agc ttg atg gaa agc tta ccg gga aag aaa gtg gga gca gaa gac     1027
Arg Ser Leu Met Glu Ser Leu Pro Gly Lys Lys Val Gly Ala Glu Asp
                300                 305                 310

att gaa aaa aca ata aag gca tgc aaa ccc agt gac cag atc ctg aag     1075
Ile Glu Lys Thr Ile Lys Ala Cys Lys Pro Ser Asp Gln Ile Leu Lys
            315                 320                 325
```

```
ctg ctc agt ttg tgg cga ata aaa aat ggc gac caa gac acc ttg aag     1123
Leu Leu Ser Leu Trp Arg Ile Lys Asn Gly Asp Gln Asp Thr Leu Lys
        330                 335                 340

ggc cta atg cac gca cta aag cac tca aag acg tac cac ttt ccc aaa     1171
Gly Leu Met His Ala Leu Lys His Ser Lys Thr Tyr His Phe Pro Lys
    345                 350                 355

act gtc act cag agt cta aag aag acc atc agg ttc ctt cac agc ttc     1219
Thr Val Thr Gln Ser Leu Lys Lys Thr Ile Arg Phe Leu His Ser Phe
360                 365                 370                 375

aca atg tac aaa ttg tat cag aag tta ttt tta gaa atg ata ggt aac     1267
Thr Met Tyr Lys Leu Tyr Gln Lys Leu Phe Leu Glu Met Ile Gly Asn
                380                 385                 390

cag gtc caa tca gta aaa ata agc tgc tta taactggaaa tggccattga      1317
Gln Val Gln Ser Val Lys Ile Ser Cys Leu
            395                 400

gctgtttcct cacaattggc gagatcccat ggatgataa                        1356
```

<210> 125
<211> 401
<212> PRT
<213> Homo sapiens

<220>
<221> misc_feature
<222> ()..()
<223> At position 63, Y is a pyrimidine.

<400> 125

```
Met Asn Lys Leu Leu Cys Cys Ala Leu Val Phe Leu Asp Ile Ser Ile
1               5                   10                  15

Lys Trp Thr Thr Gln Glu Thr Phe Pro Pro Lys Tyr Leu His Tyr Asp
            20                  25                  30

Glu Glu Thr Ser His Gln Leu Leu Cys Asp Lys Cys Pro Pro Gly Thr
        35                  40                  45

Tyr Leu Lys Gln His Cys Thr Ala Lys Trp Lys Ser Val Cys Ala Pro
    50                  55                  60

Cys Pro Asp His Tyr Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys
65                  70                  75                  80
```

```
Leu Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Tyr Val Lys Gln Glu
                85                  90                  95

Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Lys Glu Gly Arg Tyr
            100                 105                 110

Leu Glu Ile Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly Phe
        115                 120                 125

Gly Val Val Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Arg
    130                 135                 140

Cys Pro Asp Gly Phe Phe Ser Asn Glu Thr Ser Ser Lys Ala Pro Cys
145                 150                 155                 160

Arg Lys His Thr Asn Cys Ser Val Phe Gly Leu Leu Leu Thr Gln Lys
                165                 170                 175

Gly Asn Ala Thr His Asp Asn Ile Cys Ser Gly Asn Ser Glu Ser Thr
            180                 185                 190

Gln Lys Cys Gly Ile Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg
        195                 200                 205

Phe Ala Val Pro Thr Lys Phe Thr Pro Asn Trp Leu Ser Val Leu Val
    210                 215                 220

Asp Asn Leu Pro Gly Thr Lys Val Asn Ala Glu Ser Val Glu Arg Ile
225                 230                 235                 240

Lys Arg Gln His Ser Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys Leu
                245                 250                 255

Trp Lys His Gln Asn Lys Ala Gln Asp Ile Val Lys Lys Ile Ile Gln
            260                 265                 270

Asp Ile Asp Leu Cys Glu Asn Ser Val Gln Arg His Ile Gly His Ala
        275                 280                 285

Asn Leu Thr Phe Glu Gln Leu Arg Ser Leu Met Glu Ser Leu Pro Gly
    290                 295                 300
```

```
Lys Lys Val Gly Ala Glu Asp Ile Glu Lys Thr Ile Lys Ala Cys Lys
305                 310                 315                 320

Pro Ser Asp Gln Ile Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys Asn
                325                 330                 335

Gly Asp Gln Asp Thr Leu Lys Gly Leu Met His Ala Leu Lys His Ser
            340                 345                 350

Lys Thr Tyr His Phe Pro Lys Thr Val Thr Gln Ser Leu Lys Lys Thr
        355                 360                 365

Ile Arg Phe Leu His Ser Phe Thr Met Tyr Lys Leu Tyr Gln Lys Leu
    370                 375                 380

Phe Leu Glu Met Ile Gly Asn Gln Val Gln Ser Val Lys Ile Ser Cys
385                 390                 395                 400

Leu
```

<210> 126
<211> 139
<212> PRT
<213> Homo sapiens

<400> 126

```
Cys Pro Gln Gly Lys Tyr Ile His Pro Gln Asn Asn Ser Ile Cys Cys
1               5                   10                  15

Thr Lys Cys His Lys Gly Thr Tyr Leu Tyr Asn Asp Cys Pro Gly Pro
            20                  25                  30

Gly Gln Asp Thr Asp Cys Arg Glu Cys Glu Ser Gly Ser Phe Thr Ala
        35                  40                  45

Ser Glu Asn His Leu Arg His Cys Leu Ser Cys Ser Lys Cys Arg Lys
    50                  55                  60

Glu Met Gly Gln Val Glu Ile Ser Ser Cys Thr Val Asp Arg Asp Thr
65                  70                  75                  80

Val Cys Gly Cys Arg Lys Asn Gln Tyr Arg His Tyr Trp Ser Glu Asn
                85                  90                  95

Leu Phe Gln Cys Phe Asn Cys Ser Leu Cys Leu Asn Gly Thr Val His
            100                 105                 110
```

Leu Ser Cys Gln Glu Lys Gln Asn Thr Val Cys Thr Cys His Ala Gly
115 120 125

Phe Phe Leu Arg Glu Asn Glu Cys Val Ser Cys
130 135

<210> 127
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Oligonucleotide capable of hybridizing to human sequence.

<400> 127
acctacttct ttgaagagta gtcgacgaca cactatttac aggcggcc 48

<210> 128
<211> 219
<212> PRT
<213> Rattus rattus

<400> 128

Met Leu Gly Ile Trp Thr Leu Leu Pro Leu Val Leu Thr Ser Val Ala
1 5 10 15

Arg Leu Ser Ser Lys Ser Val Asn Ala Gln Val Thr Asp Ile Asn Ser
20 25 30

Lys Gly Leu Glu Leu Arg Lys Thr Val Thr Thr Val Glu Thr Gln Asn
35 40 45

Leu Glu Gly Leu His His Asp Gly Gln Phe Cys His Lys Pro Cys Pro
50 55 60

Pro Gly Glu Arg Lys Ala Arg Asp Cys Thr Val Asn Gly Asp Glu Pro
65 70 75 80

Asp Cys Val Pro Cys Gln Glu Gly Lys Glu Tyr Thr Asp Lys Ala His
85 90 95

Phe Ser Ser Lys Cys Arg Arg Cys Arg Leu Cys Asp Glu Gly His Gly
100 105 110

Leu Glu Val Glu Ile Asn Cys Thr Arg Thr Gln Asn Thr Lys Cys Arg
115 120 125

Cys Lys Pro Asn Phe Phe Cys Asn Ser Thr Val Cys Glu His Cys Asp
130 135 140

Pro Cys Thr Lys Cys Glu His Gly Ile Ile Lys Glu Cys Thr Leu Thr
145 150 155 160

```
Ser Asn Thr Lys Cys Lys Glu Glu Gly Ser Arg Ser Asn Leu Gly Trp
                165                 170                 175

Leu Cys Leu Leu Leu Leu Pro Ile Pro Leu Ile Val Trp Val Lys Arg
            180                 185                 190

Lys Glu Val Gln Lys Thr Cys Arg Lys His Arg Lys Glu Asn Gln Gly
        195                 200                 205

Ser His Glu Ser Pro Thr Leu Asn Pro Glu Thr
    210                 215
```

<210> 129
<211> 281
<212> PRT
<213> Rattus rattus

<400> 129

```
Met Gly Leu Ser Thr Val Pro Asp Leu Leu Leu Pro Leu Val Leu Leu
1               5                   10                  15

Glu Leu Leu Val Gly Ile Tyr Pro Ser Gly Val Ile Gly Leu Val Pro
            20                  25                  30

His Leu Gly Asp Arg Glu Lys Arg Asp Ser Val Cys Pro Gln Gly Lys
        35                  40                  45

Tyr Ile His Pro Gln Asn Asn Ser Ile Cys Cys Thr Lys Cys His Lys
    50                  55                  60

Gly Thr Tyr Leu Thr Tyr Asn Asp Cys Pro Gly Pro Gly Gln Asp Thr
65                  70                  75                  80

Asp Cys Arg Glu Cys Glu Ser Gly Ser Phe Thr Ala Ser Glu Asn His
                85                  90                  95

Leu Arg His Cys Leu Ser Cys Ser Lys Cys Arg Lys Glu Met Gly Gln
            100                 105                 110

Val Glu Ile Ser Ser Cys Thr Val Asp Arg Asp Thr Val Cys Gly Cys
        115                 120                 125

Arg Lys Asn Gln Tyr Arg His Tyr Trp Ser Glu Asn Leu Phe Gln Cys
    130                 135                 140

Phe Asn Cys Ser Leu Cys Leu Asn Gly Thr Val His Leu Ser Cys Gln
145                 150                 155                 160

Glu Lys Gln Asn Thr Val Cys Thr Cys His Ala Gly Phe Phe Leu Arg
                165                 170                 175

Glu Asn Glu Cys Val Ser Cys Ser Asn Cys Lys Lys Ser Leu Glu Cys
            180                 185                 190
```

```
Thr Lys Leu Cys Leu Pro Gln Ile Glu Asn Val Lys Gly Thr Glu Asp
        195                 200                 205

Ser Gly Thr Thr Val Leu Leu Pro Leu Val Ile Phe Phe Gly Leu Cys
    210                 215                 220

Leu Leu Ser Leu Leu Phe Ile Gly Leu Met Thr Arg Thr Gln Arg Trp
225                 230                 235                 240

Lys Ser Lys Leu Tyr Ser Ile Val Cys Gly Lys Ser Thr Pro Glu Lys
                245                 250                 255

Glu Gly Glu Leu Glu Gly Thr Thr Thr Lys Pro Leu Ala Pro Asn Pro
            260                 265                 270

Ser Phe Ser Pro Thr Pro Gly Phe Thr
        275                 280
```

<210> 130
<211> 207
<212> PRT
<213> Rattus rattus

<400> 130

```
Met Leu Arg Leu Ile Ala Leu Leu Val Cys Val Val Tyr Val Tyr Gly
1               5                   10                  15

Asp Asp Val Pro Tyr Ser Ser Asn Gln Gly Lys Cys Gly Gly His Asp
            20                  25                  30

Tyr Glu Lys Asp Gly Leu Cys Cys Ala Ser Cys His Pro Gly Phe Tyr
        35                  40                  45

Ala Ser Arg Leu Cys Gly Pro Gly Ser Asn Thr Val Cys Ser Pro Cys
    50                  55                  60

Glu Asp Gly Thr Phe Thr Ala Ser Thr Asn His Ala Pro Ala Cys Val
65                  70                  75                  80

Ser Cys Arg Gly Pro Cys Thr Gly His Leu Ser Glu Ser Gln Pro Cys
                85                  90                  95

Asp Arg Thr His Asp Arg Val Cys Asn Cys Ser Thr Gly Asn Tyr Cys
            100                 105                 110

Leu Leu Lys Gly Gln Asn Gly Cys Arg Ile Cys Ala Pro Gln Thr Lys
        115                 120                 125

Cys Pro Ala Gly Tyr Gly Val Ser Gly His Thr Arg Ala Gly Asp Thr
    130                 135                 140

Leu Cys Glu Lys Cys Pro Pro His Thr Tyr Ser Asp Ser Leu Ser Pro
145                 150                 155                 160
```

```
Thr Glu Arg Cys Gly Thr Ser Phe Asn Tyr Ile Ser Val Gly Phe Asn
                165                 170                 175

Leu Tyr Pro Val Asn Glu Thr Ser Cys Thr Thr Thr Ala Gly His Asn
            180                 185                 190

Glu Val Ile Lys Thr Lys Glu Phe Thr Val Thr Leu Asn Tyr Thr
        195                 200                 205
```

<210> 131
<211> 227
<212> PRT
<213> Rattus rattus

<400> 131

```
Met Ala Pro Val Ala Val Trp Ala Ala Leu Ala Val Gly Leu Glu Leu
1               5                   10                  15

Trp Ala Ala Ala His Ala Leu Pro Ala Gln Val Ala Phe Thr Pro Tyr
            20                  25                  30

Ala Pro Glu Pro Gly Ser Thr Cys Arg Leu Arg Glu Thr Thr Asp Gln
        35                  40                  45

Thr Ala Gln Met Cys Cys Ser Lys Cys Ser Pro Gly Gln His Ala Lys
    50                  55                  60

Val Phe Cys Thr Lys Thr Ser Asp Thr Val Cys Asp Ser Cys Glu Asp
65                  70                  75                  80

Ser Thr Tyr Thr Gln Leu Trp Asn Trp Val Pro Glu Cys Leu Ser Cys
                85                  90                  95

Gly Ser Arg Cys Ser Ser Asp Gln Val Glu Thr Gln Ala Cys Thr Arg
            100                 105                 110

Glu Gln Asn Arg Ile Cys Thr Cys Arg Pro Gly Trp Tyr Cys Ala Leu
        115                 120                 125

Ser Lys Gln Glu Gly Cys Arg Leu Cys Ala Pro Leu Arg Lys Cys Arg
    130                 135                 140

Pro Gly Phe Gly Val Ala Arg Pro Gly Thr Glu Thr Ser Asp Val Val
145                 150                 155                 160

Cys Lys Pro Cys Ala Pro Gly Thr Phe Ser Asn Thr Thr Ser Ser Thr
                165                 170                 175

Asp Ile Cys Arg Pro His Gln Ile Cys Asn Val Val Ala Ile Pro Gly
            180                 185                 190

Asn Ala Ser Arg Asp Ala Val Cys Thr Ser Thr Ser Pro Thr Arg Ser
        195                 200                 205
```

```
Met Ala Pro Gly Ala Val His Leu Pro Gln Pro Val Ser Thr Arg Ser
    210                 215                 220

Gln His Thr
225
```

<210> 132
<211> 197
<212> PRT
<213> Rattus rattus

<400> 132

```
Met Val Ser Leu Pro Arg Leu Cys Ala Leu Trp Gly Cys Leu Leu Thr
1               5                   10                  15

Ala Val His Leu Gly Gln Cys Val Thr Cys Ser Asp Lys Gln Tyr Leu
            20                  25                  30

His Asp Gly Gln Cys Cys Asp Leu Cys Gln Pro Gly Ser Arg Leu Thr
        35                  40                  45

Ser His Cys Thr Ala Leu Glu Lys Thr Gln Cys His Pro Cys Asp Ser
    50                  55                  60

Gly Glu Phe Ser Ala Gln Trp Asn Arg Glu Ile Arg Cys His Gln His
65                  70                  75                  80

Arg His Cys Glu Pro Asn Gln Gly Leu Arg Val Lys Lys Glu Gly Thr
                85                  90                  95

Ala Glu Ser Asp Thr Val Cys Thr Cys Lys Glu Gly Gln His Cys Thr
            100                 105                 110

Ser Lys Asp Cys Glu Ala Cys Ala Gln His Thr Pro Cys Ile Pro Gly
        115                 120                 125

Phe Gly Val Met Glu Met Ala Thr Glu Thr Thr Asp Thr Val Cys His
    130                 135                 140

Pro Cys Pro Val Gly Phe Phe Ser Asn Gln Ser Ser Leu Phe Glu Lys
145                 150                 155                 160

Cys Tyr Pro Trp Thr Ser Cys Glu Asp Lys Asn Leu Glu Val Leu Gln
                165                 170                 175

Lys Gly Thr Ser Gln Thr Asn Val Ile Cys Gly Leu Lys Ser Arg Met
            180                 185                 190

Arg Ala Leu Leu Val
        195
```

<210> 133

<211> 208
<212> PRT
<213> Rattus rattus

<400> 133

```
Met Asn Lys Trp Leu Cys Cys Ala Leu Leu Val Phe Leu Asp Ile Ile
1               5                  10                  15

Glu Trp Thr Thr Gln Glu Thr Phe Pro Pro Lys Tyr Leu His Tyr Asp
            20                  25                  30

Pro Glu Thr Gly Arg Gln Leu Leu Cys Asp Lys Cys Ala Pro Gly Thr
        35                  40                  45

Tyr Leu Lys Gln His Cys Thr Val Arg Arg Lys Thr Leu Cys Val Pro
    50                  55                  60

Cys Pro Asp Tyr Ser Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys
65                  70                  75                  80

Val Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Thr Val Lys Gln Glu
                85                  90                  95

Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Glu Glu Gly Arg Tyr
            100                 105                 110

Leu Glu Leu Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly Leu
        115                 120                 125

Gly Val Leu Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Arg
    130                 135                 140

Cys Pro Asp Gly Phe Phe Ser Gly Glu Thr Ser Ser Lys Ala Pro Cys
145                 150                 155                 160

Arg Lys His Thr Asn Cys Ser Ser Leu Gly Leu Leu Leu Ile Gln Lys
                165                 170                 175

Gly Asn Ala Thr His Asp Asn Val Cys Ser Gly Asn Arg Glu Ala Thr
            180                 185                 190

Gln Asn Cys Gly Ile Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg
        195                 200                 205
```

<210> 134
<211> 224
<212> PRT
<213> Rattus rattus

<400> 134

```
Met Gly Ala Gly Ala Thr Gly Arg Ala Met Asp Gly Pro Arg Leu Leu
1               5                  10                  15
```

```
Leu Leu Leu Leu Leu Gly Val Ser Leu Gly Gly Ala Lys Glu Ala Cys
            20                  25                  30

Pro Thr Gly Leu Tyr Thr His Ser Gly Glu Cys Cys Lys Ala Cys Asn
        35                  40                  45

Leu Gly Glu Gly Val Ala Gln Pro Cys Gly Ala Asn Gln Thr Val Cys
    50                  55                  60

Glu Pro Cys Leu Asp Ser Val Thr Phe Ser Asp Val Val Ser Ala Thr
65                  70                  75                  80

Glu Pro Cys Lys Pro Cys Thr Glu Cys Val Gly Leu Gln Ser Met Ser
                85                  90                  95

Ala Pro Cys Val Glu Ala Asp Asp Ala Val Cys Arg Cys Ala Tyr Gly
            100                 105                 110

Tyr Tyr Gln Asp Glu Thr Thr Gly Arg Cys Glu Ala Cys Arg Val Cys
        115                 120                 125

Glu Ala Gly Ser Gly Leu Val Phe Ser Cys Gln Asp Lys Gln Asn Thr
    130                 135                 140

Val Cys Glu Glu Cys Pro Asp Gly Thr Tyr Ser Asp Glu Ala Asn His
145                 150                 155                 160

Val Asp Pro Cys Leu Pro Cys Thr Val Cys Glu Asp Thr Glu Arg Gln
                165                 170                 175

Leu Arg Glu Cys Thr Arg Trp Ala Asp Ala Glu Cys Glu Glu Ile Pro
            180                 185                 190

Gly Arg Trp Ile Thr Arg Ser Thr Pro Pro Glu Gly Ser Asp Ser Thr
        195                 200                 205

Ala Pro Ser Thr Gln Glu Pro Glu Ala Pro Pro Glu Gln Asp Leu Ile
    210                 215                 220


<210>  135
<211>  205
<212>  PRT
<213>  Rattus rattus

<400>  135

Met Tyr Val Trp Val Gln Gln Pro Thr Ala Phe Leu Leu Leu Gly Leu
1               5                   10                  15

Ser Leu Gly Val Thr Val Lys Leu Asn Cys Val Lys Asp Thr Tyr Pro
            20                  25                  30

Ser Gly His Lys Cys Cys Arg Glu Cys Gln Pro Gly His Gly Met Val
        35                  40                  45
```

```
Ser Arg Cys Asp His Thr Arg Asp Thr Val Cys His Pro Cys Glu Pro
    50                  55                  60

Gly Phe Tyr Asn Glu Ala Val Asn Tyr Asp Thr Cys Lys Gln Cys Thr
65                  70                  75                  80

Gln Cys Asn His Arg Ser Gly Ser Glu Leu Lys Gln Asn Cys Thr Pro
                85                  90                  95

Thr Glu Asp Thr Val Cys Gln Cys Arg Pro Gly Thr Gln Pro Arg Gln
            100                 105                 110

Asp Ser Ser His Lys Leu Gly Val Asp Cys Val Pro Cys Pro Pro Gly
        115                 120                 125

His Phe Ser Pro Gly Ser Asn Gln Ala Cys Lys Pro Trp Thr Asn Cys
    130                 135                 140

Thr Leu Ser Gly Lys Gln Ile Arg His Pro Ala Ser Asn Ser Leu Asp
145                 150                 155                 160

Thr Val Cys Glu Asp Arg Ser Leu Leu Ala Thr Leu Leu Trp Glu Thr
                165                 170                 175

Gln Arg Thr Thr Phe Arg Pro Thr Thr Val Pro Ser Thr Thr Val Trp
            180                 185                 190

Pro Arg Thr Ser Gln Leu Pro Ser Thr Pro Thr Leu Val
        195                 200                 205
```

<210> 136
<211> 191
<212> PRT
<213> Rattus rattus

<400> 136

```
Met Gly Asn Asn Cys Tyr Asn Val Val Val Ile Val Leu Leu Leu Val
1               5                   10                  15

Gly Cys Glu Lys Val Gly Ala Val Gln Asn Ser Cys Asp Asn Cys Gln
            20                  25                  30

Pro Gly Thr Phe Cys Arg Lys Tyr Asn Pro Val Cys Lys Ser Cys Pro
        35                  40                  45

Pro Ser Thr Phe Ser Ser Ile Gly Gly Gln Pro Asn Cys Asn Ile Cys
    50                  55                  60

Arg Val Cys Ala Gly Tyr Phe Arg Phe Lys Lys Phe Cys Ser Ser Thr
65                  70                  75                  80

His Asn Ala Glu Cys Glu Cys Ile Glu Gly Phe His Cys Leu Gly Pro
                85                  90                  95
```

```
Gln Cys Thr Arg Cys Glu Lys Asp Cys Arg Pro Gly Gln Glu Leu Thr
            100                 105                 110

Lys Gln Gly Cys Lys Thr Cys Ser Leu Gly Thr Phe Asn Asp Gln Asn
        115                 120                 125

Gly Thr Gly Val Cys Arg Pro Trp Thr Asn Cys Ser Leu Asp Gly Arg
    130                 135                 140

Ser Val Leu Lys Thr Gly Thr Thr Glu Lys Asp Val Val Cys Gly Pro
145                 150                 155                 160

Pro Val Val Ser Phe Ser Pro Ser Thr Thr Ile Ser Val Thr Pro Glu
                165                 170                 175

Gly Gly Pro Gly Gly His Ser Leu Gln Val Leu Thr Leu Phe Leu
            180                 185                 190
```

<210> 137
<211> 54
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Oligonucleotide capable of hybridizing to human sequence.

<400> 137
tatggatgaa gaaacttctc atcagctgct gtgtgataaa tgtccgccgg gtac 54

<210> 138
<211> 284
<212> PRT
<213> Mus musculus

<400> 138

```
Cys Leu Lys His Arg Ser Cys Pro Pro Gly Ser Gly Val Val Gln Ala
1               5                   10                  15

Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Lys Cys Pro Asp Gly Phe
            20                  25                  30

Phe Ser Gly Glu Thr Ser Ser Lys Ala Pro Cys Ile Lys His Thr Asn
        35                  40                  45

Cys Ser Thr Phe Gly Leu Leu Leu Ile Gln Lys Gly Asn Ala Thr His
    50                  55                  60

Asp Asn Val Cys Ser Gly Asn Arg Glu Ala Thr Gln Lys Cys Gly Ile
65                  70                  75                  80

Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg Phe Ala Val Pro Thr
```

```
                85                  90                  95

Lys Ile Ile Pro Asn Trp Leu Ser Val Leu Val Asp Ser Leu Pro Gly
            100                 105                 110

Thr Lys Val Asn Ala Glu Ser Val Glu Arg Ile Lys Arg Arg His Ser
        115                 120                 125

Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys Leu Trp Lys His Gln Asn
    130                 135                 140

Arg Asp Gln Glu Met Val Lys Lys Ile Ile Gln Asp Ile Ala Leu Cys
145                 150                 155                 160

Glu Ser Ser Val Gln Arg His Leu Gly His Ser Asn Leu Thr Thr Glu
                165                 170                 175

Gln Leu Leu Ala Leu Met Glu Ser Leu Pro Gly Lys Lys Ile Ser Pro
            180                 185                 190

Glu Glu Ile Glu Arg Thr Arg Lys Thr Cys Lys Ser Ser Glu Gln Leu
        195                 200                 205

Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys Asn Gly Asp Gln Asp Thr
    210                 215                 220

Leu Lys Gly Leu Met Tyr Ala Leu Lys His Leu Lys Thr Ser His Phe
225                 230                 235                 240

Pro Lys Thr Val Thr His Ser Leu Arg Lys Thr Met Arg Phe Leu His
                245                 250                 255

Ser Phe Thr Met Tyr Arg Leu Tyr Gln Lys Leu Phe Leu Glu Met Ile
            260                 265                 270

Gly Asn Gln Val Gln Ser Val Lys Ile Ser Cys Leu
        275                 280


<210>  139
<211>  380
<212>  PRT
<213>  Homo sapiens

<400>  139

Glu Thr Phe Pro Pro Lys Tyr Leu His Tyr Asp Glu Glu Thr Ser His
1               5                   10                  15

Gln Leu Leu Cys Asp Lys Cys Pro Pro Gly Thr Tyr Leu Lys Gln His
            20                  25                  30

Cys Thr Ala Lys Trp Lys Thr Val Cys Ala Pro Cys Pro Asp His Tyr
        35                  40                  45

Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys Leu Tyr Cys Ser Pro
```

```
    50                  55                  60

Val Cys Lys Glu Leu Gln Tyr Val Lys Gln Glu Cys Asn Arg Thr His
65                  70                  75                  80

Asn Arg Val Cys Glu Cys Lys Glu Gly Arg Tyr Leu Glu Ile Glu Phe
                85                  90                  95

Cys Leu Lys His Arg Ser Cys Pro Pro Gly Phe Gly Val Val Gln Ala
            100                 105                 110

Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Arg Cys Pro Asp Gly Phe
        115                 120                 125

Phe Ser Asn Glu Thr Ser Ser Lys Ala Pro Cys Arg Lys His Thr Asn
    130                 135                 140

Cys Ser Val Phe Gly Leu Leu Leu Thr Gln Lys Gly Asn Ala Thr His
145                 150                 155                 160

Asp Asn Ile Cys Ser Gly Asn Ser Glu Ser Thr Gln Lys Cys Gly Ile
                165                 170                 175

Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg Phe Ala Val Pro Thr
            180                 185                 190

Lys Phe Thr Pro Asn Trp Leu Ser Val Leu Val Asp Asn Leu Pro Gly
        195                 200                 205

Thr Lys Val Asn Ala Glu Ser Val Glu Arg Ile Lys Arg Gln His Ser
    210                 215                 220

Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys Leu Trp Lys His Gln Asn
225                 230                 235                 240

Lys Ala Gln Asp Ile Val Lys Lys Ile Ile Gln Asp Ile Asp Leu Cys
                245                 250                 255

Glu Asn Ser Val Gln Arg His Ile Gly His Ala Asn Leu Thr Phe Glu
            260                 265                 270

Gln Leu Arg Ser Leu Met Glu Ser Leu Pro Gly Lys Lys Val Gly Ala
        275                 280                 285

Glu Asp Ile Glu Lys Thr Ile Lys Ala Cys Lys Pro Ser Asp Gln Ile
    290                 295                 300

Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys Asn Gly Asp Gln Asp Thr
305                 310                 315                 320

Leu Lys Gly Leu Met His Ala Leu Lys His Ser Lys Thr Lys His Phe
                325                 330                 335

Pro Lys Thr Val Thr Gln Ser Leu Lys Lys Thr Ile Arg Phe Leu His
            340                 345                 350
```

Ser Phe Thr Met Tyr Lys Leu Tyr Gln Lys Leu Phe Leu Glu Met Ile
355 360 365

Gly Asn Gln Val Gln Ser Val Lys Ile Ser Cys Leu
370 375 380

<210> 140
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for deletion analogue.

<400> 140
tggaccaccc agaagtacct tcattatgac 30

<210> 141
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for deletion analogue.

<400> 141
gtcataatga aggtacttct gggtggtcca 30

<210> 142
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for deletion analogue.

<400> 142
ggaccaccca gcttcattat gacgaagaaa c 31

<210> 143
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature

<222> ()..()
<223> PCR primer for deletion analogue.

<400> 143
gtttcttcgt cataatgaag ctgggtggtc c 31

<210> 144
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for deletion analogue.

<400> 144
gtggaccacc caggacgaag aaacctctc 29

<210> 145
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for deletion analogue.

<400> 145
gagaggtttc ttcgtcctgg gtggtccac 29

<210> 146
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 146
cgtttcctcc aaagttcctt cattatgac 29

<210> 147
<211> 29
<212> DNA
<213> Artificial Sequence

<220>

<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 147
gtcataatga aggaactttg gaggaaacg 29

<210> 148
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 148
ggaaacgttt cctgcaaagt accttcatta tg 32

<210> 149
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 149
cataatgaag gtactttgca ggaaacgttt cc 32

<210> 150
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 150
cacgcaaaag tcgggaatag atgtcac 27

<210> 151
<211> 27
<212> DNA
<213> Artificial Sequence

<220>

<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 151
gtgacatcta ttcccgactt ttgcgtg 27

<210> 152
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 152
caccctgtcg gaagaggcct tcttc 25

<210> 153
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 153
gaagaaggcc tcttccgaca gggtg 25

<210> 154
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 154
tgacctctcg gaaagcagcg tgca 24

<210> 155
<211> 24
<212> DNA
<213> Artificial Sequence

<220>

<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 155
tgcacgctgc tttccgagag gtca 24

<210> 156
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 156
cctcgaaatc gagcgagcag ctcc 24

<210> 157
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 157
cgatttcgag gtctttctcg ttctc 25

<210> 158
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 158
ccgtgaaaat aagctcgtta taactaggaa tgg 33

<210> 159
<211> 33
<212> DNA
<213> Artificial Sequence

<220>

<221> misc_feature
<222> ()..()
<223> PCR primer for mutant analogue.

<400> 159
ccattcctag ttataacgag cttattttca cgg 33

<210> 160
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for deletion mutant.

<400> 160
cctctgagct caagcttccg aggaccacaa tgaacaag 38

<210> 161
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for deletion mutant.

<400> 161
cctctctcga gtcaggtgac atctattcca cacttttgcg tggc 44

<210> 162
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for deletion mutant.

<400> 162
cctctgagct caagcttccg aggaccacaa tgaacaag 38

<210> 163
<211> 38
<212> DNA
<213> Artificial Sequence

<220>

<221> misc_feature
<222> ()..()
<223> PCR primer for deletion mutant.

<400> 163
cctctctcga gtcaaggaac agcaaacctg aagaaggc 38

<210> 164
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for deletion mutant.

<400> 164
cctctgagct caagcttccg aggaccacaa tgaacaag 38

<210> 165
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for deletion mutant.

<400> 165
cctctctcga gtcactctgt ggtgaggttc gagtggcc 38

<210> 166
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> PCR primer for deletion mutant.

<400> 166
cctctgagct caagcttccg aggaccacaa tgaacaag 38

<210> 167
<211> 38
<212> DNA
<213> Artificial Sequence

<220>

<221> misc_feature
<222> ()..()
<223> PCR primer for deletion mutant.

<400> 167
cctctctcga gtcaggatgt tttcaagtgc ttgagggc 38

<210> 168
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<221> misc_feature
<222> ()..()
<223> Encoded by oligonucleotide duplex used in vector formation.

<400> 168

Met Lys His His His His His His Ala Ser Val Asn Ala Leu Glu
1 5 10 15